No. 160 — The car and the appellant were brought to Maxwell Road police station. This also seems satisfactory evidence of seizure. Similarly, in Nos. 161, 162, 163, 164 and 196.

No. 218 — The appellant had claimed trial. The only evidence relating to seizure is as follows:—

Corporal 2535 of the Traffic Police gave evidence to the effect that after he had discovered the commission of an offence by the appellant he asked him to proceed to Maxwell Road police station.

The facts here are, in my opinion, similar to the facts in No. 158. There is nothing to indicate what happened to the car and the appellant could have arrived at the police station without it.

In Nos. 158 and 218 therefore, I am of the opinion that the orders of forfeiture should be set aside. In all the other appeals the orders are confirmed.

I might add that the convictions in all cases, except No. 196, will be in respect of offences as charged, with the substitution of the words "Road Traffic Ordinance, 1961" for the words "Road Traffic (Amendment) Act, 1966". Subject to this, the appeals against convictions in all the appeals are dismissed. So are all the appeals against orders of forfeiture except in Nos. 158 and 218 where I set aside the orders made.

All appeals against convictions dismissed. Appeals against order of forfeiture, except in appeals Nos. 158 & 218, dismissed.

PACIFIC TIN CONSOLIDATED CORPORATION v. HOON WEE THIM

[F.C. (Barakbah L.P., Azmi C.J. (Malaya) and Ong Hock Thye F.J.) March 9, 1967]

[K.L. — Federal Court Civil Appeal No. X.38 of 1966]

Tort — Rule in Rylands v. Fletcher — Onus of proof on the pleadings — Opinion of experts — Grounds of opinion to be inquired into — Res ipsa loquitur — Negligence — Foreseeability — Standard of care — Whether construction of ponds above ground level in mining operations was natural or non-natural user of land.

Mining — Duty of neighbours — Natural user of land.

Evidence — Expert opinion — Based on reports of facts — Proof.

The appellants, for the purpose of their dredge-mining operations, maintained on their lands large ponds separated from each other by intermediate bunds. By means of spillways the flow of water from one pond to another was regulated and the water-level of each pond maintained as desired. The lands being situated in an inclined valley, with a drop of some 60 feet, step ponds had to be constructed well above ground level. A large breach in the bund between two large ponds (which together held nearly 500,000,000 gallons of water) caused such a violent outflow from the higher pond to the other on the lower level, that the combined volume of water broke through the perimeter bund, causing extensive damage to life and property in the low-lying lands adjacent to the ponds.

In an action for damages the respondent rested his claim on two grounds, negligence and the rule in *Rylands* v. *Fletcher*.(1)

The fundamental issue was: what caused the breach in the bund? It was the appellants' case that this was due to the irruption of a subterranean spring through the bedrock, which, if true, was clearly unforeseeable and an Act of God.

Upon Gill J. ([1966] 2 M.L.J. 240) holding against respondent on the issue of negligence and against the appellant on the application of *Rylands* v. *Fletcher*,(1) the parties cross-appealed against such decision.

Held: according to the pleadings, it lay on the appellants to prove affirmatively that it was a spring from an artesian source which caused the collapse of the bund, and this onus had not been discharged;

(2) where the opinion of experts is based on reports of facts, those facts, unless within the experts' own knowledge, must be proved independently; that the conclusions, of the experts were, on their own admissions, based on false premises and ought to be rejected;

(3) the breach in the bund was due to defects in the construction or the material used or both: *res ipsa loquitur;*

(4) the common law duty of care owed by the mining company to its neighbours is as stated by Lord Atkin in *Donoghue* v. *Stevenson;* (2)

(5) the magnitude of the damage, if it ever arose, was foreseeable or ought to have been foreseen and no risks should have been taken of the bund giving way from any foreseeable or preventable cause; the degree of care taken must be commensurate with the risk;

(6) natural user of their property does not imply that miners had *carte blanche* to carry on mining operations in any manner they think fit, however hazardous to their neighbours; that the use to which the sand bund was put in this case was a non-natural user; and the rule in *Rylands* v. *Fletcher* accordingly applied.

Cases referred to:—

(1) *Rylands* v. *Fletcher* (1865-6), L.R. 1 Ex. 265; 19 L.T. 221.

(2) *Donoghue* v. *Stevenson* [1932] A.C. 562, 580.

(3) *The Wagon Mound (No. 2)* [1966] 3 W.L.R. 498, 512.

(4) *The Wagon Mound (No. 1)* [1961] A.C. 388.

(5) *Bolton* v. *Stone* [1951] A.C. 850.

FEDERAL COURT.

P. Mooney (*J. Puthucheary* with him) for the appellants.

Denis Murphy and *T. G. Dunbar* for the respondent.

Cur. Adv. Vult.

Ong Hock Thye F.J.: This is an appeal against the judgment of Gill J. holding the appellants liable for damages under the rule in *Rylands* v. *Fletcher*.(1)

It has fallen on me to lead off with this judgment, although I should have preferred to inform myself first of the judgments of my abler, learned colleagues. I shall, therefore, concentrate mainly on the questions of fact

which in my opinion are sufficient for the determination of this appeal and leave it to them to dilate on the questions of law.

There is practically no controversy as to the primary facts. The appellants, for the purposes of their dredge-mining operations, maintained on their lands large ponds or reservoirs of water which were separated from each other by intermediate bunds, with one perimeter bund enclosing all these bodies of water. By means of spillways, the flow of water from one pond to another, as well as its ultimate discharge into a river, was regulated and the water-level of each pond maintained as desired. We are here concerned only with two ponds, designated as P1 and P2, and with the bund separating them, referred to as bund A.

The topography of the appellants' lands was described by a mining engineer Mr. Waugh. They are situate in an inclined valley, approximately 2½ miles in length, the drop in ground level being 60 feet over this stretch. Another feature is that this mining area is within a catchment basin of some 10 square miles, with two rivers of large and variable run-off flowing through it. As the mining and slimes retention areas were all in the slope of the valley, the appellants met the problem by constructing a series of step ponds to control the slimes and provide water-cushions for preventing erosion. Because of the 60-foot drop it was necessary to carry the water above ground and the ponds, used also for slimes retention, had to be above the level of the surrounding lands for the same reason.

It was not in dispute that a large breach in bund A caused such a violent outflow from P1 into P2 that the combined volume of water from both ponds broke through the perimeter bund and caused all the damage for which the present respondent has sought compensation. His claim, for present purposes, rested on two grounds, namely, negligence and the rule in *Rylands* v. *Fletcher*. The appellants had repudiated all liability.

The fundamental question for determination was: What caused the breach in the bund? It was the appellants' case that the breach was due entirely to the irruption of a subterranean spring, which, if true, was clearly unforeseeable and an Act of God. This would have afforded a complete defence to the action.

The trial judge, having decided against the respondent on the issue of negligence and against the appellants on the applicability of the rule in *Rylands* v. *Fletcher*, both parties now appeal to this court.

I shall deal first with the case for the appellants, but, before I proceed to do so, I feel I ought to express my indebtedness to the learned trial judge for a careful, lucid and comprehensive summing up of the relevant evidence in his judgment. The exercise he faced was a difficult one, having been set the task of exploring the arcanum of recondite subjects on which expert witnesses gave such voluminous evidence that it became hardly possible to see the wood from the trees.

According to the pleadings, however, it lay on the appellants to prove affirmatively that it was a spring from an artesian source which caused the collapse of the bund. Their evidence on the one hand, was that the collapse was due to piping caused by a spring which manifested itself in the manner described by experts. On the other hand, they claimed that, but for the spring, the collapse could not have occurred because the bund was so soundly constructed that all other possible causes could be eliminated.

The appellants' case thus presented two aspects, positive as well as negative. For the former they relied on the evidence of two geologists, Dr. Fitch and Dr. Garnett.

According to Dr. Fitch it was an inescapable conclusion that the collapse was caused by a spring emerging below the downstream slope of the bund due to water reaching the site through underground channels under pressure from a distant source. His explanation, in his own words, was as follows:

> "In this case there was boiling on the downstream side of the bund, quicksand in the breach after the collapse and an artesian flow on the upstream side of the bund. I am sure those events were not related to different causes. All the evidence is consistent with the water having come from one place in the bedrock, I think at a point upstream of the bund in the area of the tube wells, possibly within the area of the sand mat. It was unable to come out in P.1 while the water was in P.1 because of the weight of water in P.1, a layer of slimes on the floor of P.1 and the weight of the bund itself. It forced itself out in P.2 and appeared as a boil. It took the line of least resistance. The quicksand was, like the spring, due to a rising column of water. When the bund and the water in P.1 had gone, the spring moved towards a vertical course and before it reached the area of the tube well it rose within the breach and caused the quicksand. The quicksand was caused after the collapse when it was seen. Initially the quicksand was where the boil appeared. It was below the water, so that no one could see. The quicksand moved nearer to the point of origin as the pressure decreased."

According to him the state of the bund was immaterial:

> ". . . the nature of the bund has no bearing on the case, nor does the head of water in P.1 at any time. The size of the bund is irrelevant. The precise nature of the material of the bund is also irrelevant. The presence of an impermeable core would have made no difference whatsoever. Any bund that could conceivably be built here would have been destroyed by the spring."

It was apodeictic that nothing but the spring could have undermined the bund, although another geologist, Dr. Garnett, was hardly prepared to be dogmatic when he said:

"The appearance of the spring in the area for the first time would be an unprecedented phenomenon. Nevertheless, I have come to the conclusion that this is what did happen. I base my conclusions on a knowledge of what can occur on a limestone bedrock. Unprecedented in this area, but not unprecedented in other areas. I do not say that this happened here. I put it forward as the only explanation I can see for what happened. If weakness of the bund was not the cause of the collapse, this would be the only other explanation. I did not arrive at my conclusion by process of elimination. I did not start off with the assumption that there was no defect in the bund."

Both these geologists had proceeded on the hypotheses of certain data supplied by the appellants, namely, the boil, the quicksand and the artesian flow. According to Dr. Fitch the pressure of the water emerging from the bedrock would be "like that of a fire-hose", so that "when the water broke out it would be a violent process". He thought that the hole in the bedrock was below P1. How the waters of this spring travelled underwater from that point so as to break surface in P2 was explained thus:

"The water after coming out of the spring travelled about 150 feet to the other side of the bund before it appeared in the form of a boil. It would not be more likely to rise vertically and appear in P.1 itself because of the presence of a layer of slimes on the sand mat in P.1 and the depth of water retained by the bund and also the weight of the bund itself. The weakest area was immediately below the downstream side of the bund. The weight of the water in P.2 was much less."

Dr. Garnett thought along similar lines:

"Water from a spring would cause boiling. The water emerged on surface in P.2 and travelled through the alluvium and sand mat to that point. It chose the path of least resistance. The path of least resistance was down towards P.2."

The trial judge did not accept such expert opinion and one of the main criticisms levelled against his judgment is that he should not have ignored "the evidence of highly qualified and independent experts who had made a study of the cause of the breach", but should have held, upon such evidence, that the breach was caused by the emergence of an artesian spring. It is argued that, when their evidence stood uncontradicted, it could not be ignored; that, in dealing with matters of science, the views of the judge himself, as a layman, should yield to those of the expert; and that no alternative view differing from that of the experts could be tenable without cogent evidence in its support.

This argument, however, ignores the fact that, in all cases in which opinion evidence is receivable, whether from experts or not, the grounds or reasoning upon which such opinion is based may properly be inquired into. Where the opinion of experts is based on reports of facts, those facts, unless within the experts' own knowledge must be proved independently: see *Phipson on Evidence,* 10th Ed., 1280.

Both Dr. Fitch and Dr. Garnett, of course, had accepted without question the evidence of the appellants' witnesses regarding the boil, the quicksand and the artesian flow. Consequently, the judge was perfectly correct in endeavouring to satisfy himself that their conclusions were not based on false premises.

Refusing, therefore, to accept these experts' evaluation of what they considered relevant and true, the judge made his own independent examination of the evidence. In the result, he found as a fact "that the boil of water in P.2 was not caused by the emergence of any spring." As to the quicksand, he felt considerable doubt about its existence, but contented himself by saying that he "cannot accept the presence of the quicksand as conclusive evidence of the existence of a spring underneath." As regards the artesian flow — while granting the likelihood of underground springs under the limestone bedrock — he took the view that such springs "could not appear on the surface in the middle of a valley until tube wells were sunk over or near them so as to make it possible for water to gush out through the tube." He came to this conclusion after taking note of certain facts which he stated as follows:

"The first well was sunk as near as possible to the bund where the boiling of water occurred in P.2. That did not produce evidence of a spring. In fact many tube wells were sunk before one with water was found. The tube wells from which Mr. Daniell found artesian flow were 100 feet away from the centre of the bund."

For these reasons, then, the judge held that the failure of the bund was not due to the sudden emergence of any underground spring or springs.

His judgment was, however, strenuously attacked on a number of points. With all respect to counsel, I shall refrain from discussing them in detail. Instead, I shall re-examine the evidence independently to see whether or not, in the judge's place, I should have accepted the opinion of these experts.

I think that, for the layman, there is a simple test of the validity of the experts' theory, inherent in the theory itself. In a nutshell it is this. Were I to accept Dr. Fitch's conclusion as true, I should have to believe that an unbroken impermeable layer of slime extended between the point in P.1, where the spring emerged through the bedrock, and the point where it surfaced as a boil in P.2. I should also have to believe that, between these two points, for a distance of 150 feet, the spring which emerged from the bedrock with the force of a fire-hose then wormed its way along a line of least resistance, as would a stream of water contained in a real hose which had no means of escape except through the nozzle.

Now, according to Dr. Fitch himself — and I refer to the last quotation from his evidence — the water from the spring could not have risen vertically to the surface in P.1 "because of the presence of a layer of slimes on the sand

mat in P.1", the pressure of the water over it and the weight of the sand bund itself.

Dealing with each factor in turn, the assumption of an impervious layer of slime over the relevant area was clearly unwarranted and contrary to the evidence. Mr. McLean, the appellants' mine superintendent, had admitted that they stopped pumping slimes into P.1 in May 1961, since when it had only been used as a reservoir and for the retention of slimes deposited before that date. Then there is undisputed evidence that the breached portion of bund A was situate in the area which had been dredged between April and June 1962; that this bund had in fact been twice rebuilt, the first occasion after the dredge crossed over from P.2 to P.1 in 1960 and the last after the same dredge recrossed back to P.2 about June 1962. The rebuilding was completed in November 1962, only eleven months before its collapse. In the result, Dr. Fitch had to contradict himself as he did, thus: "There is no continuous impermeable layer in P.1 because the dredge had moved several times through this area and any impermeable layer would be destroyed;" and later, this again, "It was impossible for there to be a continuous impermeable layer above the bedrock in P.1."

This protective layer of slime was, of course, the keystone of Dr. Fitch's entire thesis. It had to be present, not only to provide an explanation for the spring failing to rise vertically to the surface in P.1, but also to account for two other phenomena otherwise inexplicable. Why else should the spring be unable to mix and lose itself in its own element if nothing prevented it from intermingling with the waters of P.1? Why again, after the spring had burst directly upon the sand mat or sand bund, should it fail to cause disintegration of the same then and there, but proceed to do so upon identical bunding material 150 feet away? To both these questions I can find no logical answer. Once it is established that there was no intervening layer of slime over the relevant area, it seems to me that nothing remains to bolster Dr. Fitch's theory. I am, therefore, satisfied that the trial judge was completely justified in rejecting the opinion of Dr. Fitch. Dr. Garnett's evidence naturally stood on the same footing. Consequently I also find as a fact that the failure of the bund was not due to any spring or springs as alleged.

Since the trial judge had expressed his views regarding the three alleged facts in somewhat equivocal terms, I think it would be as well to leave no stone unturned. In the first place, was there a boil? In my view, possibly yes, due to lateral piping. Since it was common ground that piping caused the collapse, then it must have been either vertical piping, due to the underground spring, or lateral piping, not attributable to any such spring. As I think the spring was a figment of Dr. Fitch's imagination, I am compelled to conclude that lateral piping, due to seepage, is the only alternative explanation. According to Dr. Garnett there could be only two causes for the collapse, either a spring or weakness of the bund.

In the second place, was there quicksand at the spot where Mr. Waugh sank to his waist? I think not. Since the onus rested on the defendants to prove the fact they alleged, their failure to satisfy the judge of its existence must lead inevitably to an adverse conclusion. Mr. Waugh's mere *ipse dixit*, of course, was not enough. He did not even condescend to particulars showing why he thought it was a patch of quicksand into which he fell; instead, it was left to Dr. Fitch and Dr. Garnett to take his word for it. That they did so hardly proves anything. It may be observed that Mr. Waugh inspected the breach on October 10, the day after the the collapse. On that date he made the accidental discovery. He described what ensued as follows:

> "It occurred to me two or three days after the breach that there was a spring or springs in the limestone bedrock. . . . I connected the quicksand with the boil and started sub-surface investigations on 13th or 14th October, 1963. I connected the quicksand with the collapse within 4 or 5 days after the accident."

Having at that early stage appreciated the significance of his discovery, he went on, however, to say, "I did not carry out any further investigations about the quicksand", and this, notwithstanding as he explained, "Quicksand brought the possibility of springs to my mind" and that he had been called in to investigate the cause of the collapse. Hence it is not entirely surprising that the trial judge, quite apart from having seen and heard Mr. Waugh, chose to disregard his evidence. Speaking for myself, it goes without saying that, once the theory of Dr. Fitch and Dr. Garnett had been exploded, there could not have been any quicksand without a spring to make the sand quick.

In the third place, did the tube wells prove anything? In my view the answer again is no. The boring results had unquestionably negatived any artesian flow under the breach, or sufficiently proximate thereto. True, the tube wells disclosed an artesian flow of sorts elsewhere under the bedrock and only in P.1, but its continued existence, discovered only after boring, seems to me more consistent with its underground containment than its having forced an exit in order to bring about a release of pressure. Remembering that the water channel was of the size of one square foot, as stated by Dr. Fitch, and that the water escaped therefrom with the force he described, was it likely that an exit of commensurate size would not have disclosed itself during subsequent spells of heavy rain or could have escaped discovery in spite of diligent search? The appellants had had more than two years until the trial of this action to substantiate

the opinions of their experts.

I turn now to the negative aspect of the appellants' case. They contended that the bund would not have collapsed but for the spring. A great volume of evidence was relied on and much was made of the evidence of Mr. Vail, a dam consultant, of *in situ* density tests and *in situ* moisture tests, of compaction tests and grading analyses, all of which were said to have established that the bund was of sound construction. Although the evidence of Mr. Vail conveys the impression that he was theorising to a very great extent, he endeavoured to seek support from a world-renowned authority on soil mechanics. This was Professor Bishop, of whose evidence I think the judge has made a fair and accurate summation as follows:

"His view was that the test data which he was providing by itself would not indicate the cause of the disaster which had taken place. He felt that in a case of this sort an examination of the bund itself and of the mat on which it stood would not necessarily provide the solution to the failure of the bund. He expressed the opinion that a detailed knowledge of the geology and topography of the site would be necessary to express a clear opinion on the cause of the failure of the bund. In his opinion water pressure, particularly in periods of heavy rainfall, whose origin is a source some distance from the site can act in an artesian form causing uplift pressures beneath a bank or bund, possibly even failures."

What, however, is even more to the point, in considering the opinion of Mr. Vail, is the homily which Professor Bishop delivered:

"The phenomenon is known sometimes as piping or sometimes as internal erosion which can result under certain circumstances, but I should point out that it is considered by the experts to be one of the least predictable of engineering phenomena in this field. Professor Terzaghi, who until his death was the leading authority in the field of soil mechanics, acted as general reporter on this subject at the Large Dams Congress in, I think, 1948, and anyone trying to predict whether or not erosion or piping would occur would be advised to read his general report and see how, with all the experience he had and that had been made available in the conference, it was apparent it was one of the least predictable of engineering phenomena."

Mr. Vail respectfully agreed as of course with Terzaghi that "the mechanics of piping by underwater erosion defy theoretical approach" and that "the sequence of events can seldom be reconstructed." Nevertheless he seemed to have rendered only lip service to Terzaghi, as shown by the following quotations of his opinion:

(1) "If there is excessive seepage in a bund leading to the piping stage, there is a violent settlement of the bund. . . . If the boiling which Mr. Mayne saw was caused by piping through the bund, there would have been a simultaneous settling of the bund. In the last stages it would have been violent."

(2) "If there had been a differential of about 10½ feet about 10 days before the accident that would have imposed a greater strain on the mat. . . . It is not possible that the greater differential led to the collapse of the bund 10 days later. Had the more severe conditions existed for one day only there might have been this possibilitiy. . . . If the differential of 10 feet was sufficient to cause collapse it would have caused collapse before."

(3) "I have ruled out all possibilities except piping through the mat from some source of pressure other than the water in P.1."

(4) "The most critical conditions for piping would be immediately underneath the bund, within 4 feet."

(5) "I felt it was unnecessary to take dry density below 7½ feet."

(6) "By visual knowledge and by the way the bund was placed I was satisfied that the density of the bund was within 4 to 5 pounds, representing about 4%."

(7) "On the basis of the flow nets I say that the bund was stable against excessive seepage."

(8) "It is difficult to make calculations of the flow through laminating material. I made the calculation on the assumption that the material in the mat was homogeneous. I then assumed that 50 per cent of the mat consisted of coarse material. I checked it by further method, assuming that horizontal permeability would be 10 times the vertical permeability. I don't think that in this case the horizontal permeability would be 10 times the vertical. . . . I assumed in my calculations that horizontal was three times vertical permeability in arriving at my factor of safety. Very much depends upon the difference in horizontal and vertical permeability. I took the 1/3 ratio as my considered opinion. I did not carry out tests to ascertain the ratio of the vertical to the horizontal permeability. That would have been possible. I took 1/3 ratio on visual inspection."

(9) "The fact that the bund withstood greater pressure previously is an important factor. . . . If the bund was unstable it would have collapsed in a short time after that pressure was exerted against it in a matter of days (3 or 4 days)."

(10) "The boil in the downstream would have a corresponding vortex on the upstream."

There is, moreover, one infirmity in his evidence which does not appear to have been generally appreciated. He had stated himself that piping failure "depends very largely on minor variations in the composition of the bund and mat and although calculations can show whether the bund was or was not likely to fail in this way it is impossible to establish after the collapse exactly how the failure occurred." Since, "minor variations" could make a great deal of difference, one naturally has to examine with some degree of care the tests he carried out to enable him to do the impossible, namely, after the collapse — when all evidence of any weakness or defect in the breached portion of the bund had been washed away — to establish "exactly how the failure occurred."

All the tests were made by "taking soil samples as near to the site of the collapse as possible", that is to say, from the remaining portions of the bund which had survived the flood. It seems to me self-evident that, when one portion gave way, while another stood up to a strain which affected the whole bund equally, they were not equally stable, unless the collapse could be traced to some external cause operating on one but not the other. *Res ipsa loquitur.* Hence the conclusions founded on the soil tests were based on false premises and misleading.

I cannot see how Mr. Vail could substantiate his opinion regarding the breached portion, on which no tests were possible, any more than an autopsy can be performed on a non-existent corpse. It may be added that he had never before investigated the failure of a dam, after the event; all his previous experience lay in the investigation of failures where there had been no breach and the evidence remained readily to hand. In the result, I take the same view of Mr. Vail's evidence as the trial judge.

Having done so, I now turn to the other facet of the same question. Since I hold that the collapse was not due to any spring, I would point out that, according to Mr. Vail himself "Seepage is the first thought that comes to one's mind when considering the failure of a sand bund". Why should I not accept this alternative explanation when Mr. Vail has eliminated all other possible causes? Dr. Garnett, too, had no alternative to offer. I accordingly hold, for these and other reasons that will appear later, that the breach in the bund was due either to defects in its construction or the material or both. This naturally raises the broader issue of negligence, on which the respondent has cross-appealed.

With respect, I do not think that the learned trial judge had given as full consideration to this issue as to the rule in *Rylands* v. *Fletcher*. In his judgment he says:

> "As far as negligence is concerned, the plaintiff would appear to rely almost entirely on the doctrine of *res ipsa loquitur*. But, apart from the *res* there is no other evidence of negligence and I do not think the *res* itself makes out negligence. Apart from a rather half-hearted plea that the defendants should have given warning of the imminence of the flooding condition, the method of constructing the bund can hardly be relied on as some sort of negligence on the part of the defendants. It has been contended by the defendants that no one is bound to foresee every conceivable eventuality. With that as a general statement I agree. I also agree that if the possibility of danger emerging is reasonably apparent, then not to take precautions is negligence, but not otherwise. In my opinion the evidence does not make out negligence."

While it is true that counsel for the respondent made only the briefest of submissions at the conclusion of the trial, relying mainly on *res ipsa loquitur*, it must be remembered that the particulars of negligence quite compendiously rang the changes of failure, in various forms, on the part of the appellants to exercise a proper duty of care in their mining operations, ranging from failure to construct and maintain the banks of the reservoirs in sufficient strength, to using an improper bund for the retention of water. In my opinion the evidence plainly disclosed a state of affairs which the learned trial judge should not have passed over without a word of comment.

As this issue was dealt with by the judge in such cursory fashion, I think I ought to dwell on it at some length and detail, having regard only to the evidence on the record. But before I do so, I should make clear what I consider the guiding principles. First, I think it is retrogressive and unrealistic — if the common law is to continue a living, dynamic force — not to give full weight to the classic pronouncement of Lord Atkin in *Donoghue* v. *Stevenson*: [2]

> "The rule that you are to love your neighbour becomes in law, you must not injure your neighbour; and the lawyer's question, Who is my neighbour? receives a restricted reply. You must take reasonable care to avoid acts or omissions which you can reasonably forsee would be likely to injure your neighbour. Who, then, in law is my neighbour? The answer seems to be — persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question."

Secondly, I think I may properly spare myself the supererogatory labour of discussing the numerous authorities cited on both sides by referring solely to the judgment of the Privy Council in *The Wagon Mound (No. 2)*.[3] The principle stated by Lord Reid is as follows:

> "If a real risk is one which would occur to the mind of a reasonable man in the position of the defendant's servant and which he would not brush aside as far-fetched, and if the criterion is to be what that reasonable man would have done in the circumstances, then surely he would not neglect such a risk if action to eliminate it presented no difficulty, involved no disadvantage, and required no expense."

Although an infinite variety of situations perenially occur, which raises the question whether the proper duty of care was exercised in each particular case, *The Wagon Mound (No. 2)* is most instructive not only in that the Board drew an inference differing from that of Walsh J., but also in the very questions which were therein so explicitly stated.

In the instant case, the appellants by their defence had admitted that there were substantial quantities of water in their reservoirs and that, if the water escaped, damage would surely follow. At the time of the flood the two ponds held about 500 million gallons of water. The appellants' mines adjoined a thickly populated area; in fact the floods affected about 10,000 people. The magnitude of the damage, if it ever arose, was clearly foreseeable or ought to have been foreseen by them. It was equally plain that no risks should have been taken of the bund giving way from any foreseeable or preventable cause.

In *The Wagon Mound (No. 2)* their Lordships made this comment on the findings of fact by Walsh J. (at p. 510):

> "The vital parts of the findings of fact which have already been set out in full are (1) that the officers of *The Wagon Mound* 'would regard furnace oil as very difficult to ignite upon water' — not that they would regard this as impossible; (2) that their experience would probably have been 'that this had very rarely happened' — not that they would never have heard of a case where it had happened, and (3) that they

would have regarded it as a 'possibility, but one which could become an actuality only in very exceptional circumstances' — not, as in *The Wagon Mound (No. 1)*,[4] that they could not reasonably be expected to have known that this oil was capable of being set afire when spread on water."

Then, referring to *Bolton* v. *Stone*,[5] they said:

"The House of Lords held that the risk was so small that in the circumstances a reasonable man would have been justified in disregarding it and taking no steps to eliminate it.

But it does not follow that, no matter what the circumstanses may be, it is justifiable to neglect a risk of such a small magnitude. A reasonable man would only neglect such a risk if he had some valid reason for doing so, e.g., that it would involve considerable expense to eliminate the risk. He would weigh the risk against the difficulty of eliminating it. . . . In their Lordships' judgment *Bolton* v. *Stone* did not alter the general principle that a person must be regarded as negligent if he does not take steps to eliminate a risk which he knows or ought to know is a real risk and not a mere possibility which would never influence the mind of a reasonable man. What that decision did was to recognise and give effect to the qualification that it is justifiable not to take steps to eliminate a real risk if it is small and if the circumstances are such that a reasonable man, careful of the safety of his neighbour, would think it right to neglect it."

Since the greater the magnitude of the possible injury, the greater must be the duty of care, my view is that the appellants cannot escape liability unless they were shown to have exercised a degree of care, commensurate with the risk, not only in the building and maintenance of the bund, but also in guarding it against damage by all foreseeable causes, including excessive stresses and strains. Their duty in this respect would only be subject to the qualification stated by Lord Reid, that action to eliminate the risk "presented no difficulty, involved no disadvantage and required no expense." In the present context I would, with the greatest respect, substitute for the last two words the phrase "no unreasonable expenditure."

It was generally agreed that sand is highly permeable. However, it was claimed that this quality in the bund had been offset by its size and slope calculated to ensure its stability.

Putting the appellants' case at its highest, I shall now quote, from Mr. Mooney's submission, that this collapse was the first case of its kind in Malaya; that the appellants were a very experienced mining company whose methods were not excelled or even equalled by others, and that the collapse was unforeseeable. Granted that the event was unique in their experience, the test of foreseeability is still an objective one. The crucial question here is not whether a sand bund should not have been used at all by the defendants for their mining operations, but whether everything reasonable had been done to render the possibility of its collapse too remote ever to occur to the mind of a reasonable man. They should have weighed the risk against the difficulty of eliminating it.

To have required them to transport earth and other material to the site, at considerable expense and trouble, would be putting their duty too high. But, when they had decided on using sand, because they had nothing else to use, was it too inconvenient or too expensive for them to have also seen to it that the side slopes of the new bunds were vegetated in the same way as the perimeter bunds and the older portion of bund A? Nowhere did a vegetated bund appear to have suffered serious damage. To an experienced mining company the effect of vegetation could not have been unknown and they had more than ample time to carry out the task because, after the bund was rebuilt, it took several months to raise the water level in P.1 from the toe of the bund itself. Vegetation, one should have thought, was all the more necessary for a new sand bund which had no protective layer of slimes.

Another point, of which the trial judge took note, was that at the time of the accident, P.1 was essentially a water reservoir for the purpose of supplying water to the dredge paddock. According to Mr. Mayne he had received instructions from his superiors to raise the head of water in P.1. As he explained it:

"The scheme of getting the second pipe line was thought of about a month before the accident. That was because there was not sufficient water coming in quickly. The second pipe line was in the process of being installed. The head of water had been raised during that month. That was to get as much water as possible through the one pipe."

Mr. McLean, who designed the bund, said he knew nothing of soil mechanics, but according to him, "My experience told me that the bund would be able to stand up to what was required of it." This type of bund, he claimed, was used throughout Malaya, meaning "a bund built on a sand mat with a rock and clay core and consisting on the top of medium sand with slimes and clay." He conceded that a bund made of sand without silt and clay would not be the usual type of bund in Malaya. He thus described how he constructed the bund:

"Rock and clay was laid on the sand mat. On the top of the bedrock were lumps of rock, clay, sand and slimes. On top of that I put sand. . . . When building the bund I was pouring sand into water. . . . The bund proper was built from a stockpile of sand, slimes and clay."

He was, however, unable to explain why the samples sent to Professor Bishop contained neither clay nor silt.

As a bund made without silt or clay would not be the usual type of bund in Malaya. the question arises whether there was any defect in the construction, which the appellants ought to have known, had they taken the trouble to make any test at all. Mr. McLean admitted that he had made no tests of the materials he used for building the bund. He had built, not only bund

A, but also another, on which spillway 17 was located. Was it, then, a coincidence that on the afternoon of October 8, the eve of the flood, the bund near spillway 17 was leaking? Mr. McLean's evidence was:

"The bund at spillway 17 was built in the same way as bund A. I am not absolutely certain, but I think I probably built it. I was about the place when it was being built. Occasionally there are seepages through sand bunds. I did not expect the seepage that happened in the bund inside spillway 17. At that time I thought the water was too high. I am still of the same opinion. The bund was not designed to hold water at that level for a long time. There was a big damp patch on the side of the bund with water trickling down. The water trickling down was carrying grains of sand."

Such seepage process, carrying away grains of sand, was clearly characteristic of piping, on which the experts entertained no conflict of opinion. Since this bund showed clear signs of weakness under strain, my attention almost automatically proceeded to focus itself on an unexplained 190-foot breach southwest of spillway 13. Reference to the plans D, E and Exhibit D.26 showed that this breach occurred in a bund that must have been built at about the same time and in the same manner as bund A, after the dredge had worked over the area. Mr. McLean explained that this breach "existed before the breach at bund A occurred. It had nothing to do with the breach at bund A."

It is rather unfortunate that Mr. McLean was not further examined by counsel on either side to clarify this point. Nevertheless, I think certain inferences may properly be drawn from the established primary facts: (a) that this bund was of the same construction and age as bund A and (b) that it was breached to the extent of 190 feet. Now, this particular bund was part of a system. If it was worth building at all it should have been built to specifications calculated to make it as stable as bund A. Yet it collapsed in less than a year. Unless the breach was made deliberately to serve some purpose, what other inference may I draw than that the collapse was due to a structural weakness or defect? Mr. Murphy, cross-examining Mr. McLean, was content merely with the answer that the breach preceded the accident. But as the fact had been elicited in examination-in-chief and Mr. Mooney had refrained from obtaining any explanation then or in re-examination, I think I am not precluded from drawing such inference from the primary facts as appears to me reasonable and probable. In my view this other breach is a fact of no little significance. Although the date of its occurrence was so vague as to be impossible to determine, the fact remains that the appellants knew of this breach long before the accident. Was it not their duty then to have ascertained the cause? Or did they turn towards it a blind eye? Considering the manitude of the damage any breach in another section of the bund would be likely to cause, I think I am right in holding that, if the appellants chose to be indifferent to an obvious risk, they should not expect to escape liability for a serious omission in the duty of care they owed their neighbours.

It is fortunate that the realities of the situation failed to be entirely obfuscated by the mass of expert evidence. Thus it was disclosed by Mr. Mayne that the steps taken by Mr. McLean the day before had proved ineffective. Removal of a single board from spillway No. 17 might have slightly lessened the strain of a high head of water. It could not seal any leak. At 9.30 a.m. on October 9, when Mr. Mayne went to inspect the bund near spillway 17, he saw "sand moving away from the bund". Not only that, but also 4 or 5 leaks in the same bund and a substantial slipping of the sand from the bund near spillway 13. He noticed that:

"On October 9, the difference in water level between P.1 and P.2 was 5 or 6 feet. P.2 was somewhat higher than usual on that day. It was at the highest level that I had seen. . . . The height of water on 9th October, 1963 in P.1 was just over 163 feet above sea level. The level of the water in P.2 was 158 feet. . . . The water in P.2 was about 1 foot to 1½ foot from the top of the bund. The leaks were at the same level as the water. . . . The water was higher than I had ever seen before and the bund was leaking."

On the same point Mr. McLean said:

"The water-level near spillway 17, on 8th October, 1963 was between a foot and 18 inches below the top of the bund. That was too high. I believe the mines department often require a minimum of 3 feet from the top. In my opinion 2 to 3 feet in that area would be a minimum, but I would prefer 3 feet."

Since the difference in water level of P.1 and P.2 was a material fact on account of the load or strain the greater weight would have imposed on a sand bund, it was one of the grounds of appeal that the judge erred in stating "that Mr. McLean said the water in P.1 was 13 feet deep," whereas "the only evidence given as to the depth of the water showed that it was 3 to 4 feet deep". With respect, I consider the criticism not only unfounded, but contrary to the evidence of Mr. McLean himself. On page 90 of the record he said, "The water in P.1 was at least 13 feet above the sand mat." On page 92 he said "The head of water in P.2 was in the region of 18 feet." On page 78 he stated the differential with date: "On the 8th October, 1963 I noticed the difference in water level of the water in areas P.1 and P.2. The water in P.2 was lower by about 6 feet," which was approximately correct.

Following this up with the evidence of Mr. Mayne, it will be seen that, if the judge was indeed in error, then Messrs. McLean and Mayne had themselves to blame. Of the water level in P.1 Mr. Mayne said:

"In March 1963 there was very little water in P.1. . . . Water was up to the toe of the bund. . . . The water level was raised gradually over a period of several

months. It was a big area and it took a long time to fill up. . . . In April 1963 it was a little higher. We let the water level rise naturally. Thirteen feet of water in P.1 would be a substantial quantity of water. . . . The entire scheme of getting water from P.1 for the paddock was started before Mr. McLean went on leave in March 1963."

With that scheme in operation, I do not think any one would suppose that the water level was moving at any time in any direction except upwards. I have looked in vain for evidence that the water in P.1 was never more than 3 to 4 feet deep.

Mr. McLean claimed that he inspected bund A twice a week before the breach, and that he had watchmen on the bunds and spillways continually, who inspected the bunds every day and every night. If that was true, I am at a loss to understand why the water level in P.2 would have risen — unnoticed or without countermeasures taken — to a level which "was too high" for a bund "not designed to hold water at that level for a long time", which level, according to Mr. Mayne, was not only "too high", but also in disregard of known requirements of the mines department.

Bund A was designed by Mr. McLean for about 12 feet of water from the base. There was no suggestion that the other bund, which held spillway 17, was constructed to any higher specifications. Yet it was left to bear a load imposed by 18 feet of water. Moreover, a differential of 9 to 12 feet between the heads in P.1 and P.2 had been allowed to go on for as long as two months. The appellants' own experts were positive that there was at least some strain on bund A as a result. Could not the piping process have been started then?

For the reasons stated above, I am of the opinion that the learned trial judge was wrong on the issue of negligence. I find ample evidence thereof. The appellants were neither vigilant nor diligent in the performance of the duty of care they owed their neighbours. I would allow the cross-appeal.

Having reached this decision I need only express my agreement with the learned judge that the rule in *Rylands* v. *Fletcher* was clearly applicable. In my view, natural user of their property does not imply that miners had *carte blanche* to carry on their mining operations in any manner they think fit, however hazardous to their neighbours. On this point I refer to unchallenged evidence of Mr. Curtis, who was Senior Inspector of Mines, South Zone, Malaya, at the relevant time. He had inspected the breach, but seen no slimes on the upstream slope of the bund. Of the use of sand bunds he was deposing to facts within his own knowledge, observed by him in his professional capacity, when he said:

"It is not usual for tin mines in Malaya to have pools like P.1 for retaining water except for mine holes below ground level.

It is common practice to use ponds such as old mine holes of other areas to retain slimes. Slimes areas have bunds around them. A slimes area will have approximately one foot of water overlying the slimes in these bunded areas. That would be the normal thing for a bunded slimes area.

I have known of sand bunds for enclosing slimes areas. That is common practice. I can only recall one other sand bund which was used to retain a large quantity of water, apart from the bund built by the defendants. I came to know of that because it burst and I was called to make a preliminary investigation of the accident."

He was not cross-examined, although he was stating facts rather than giving opinion evidence. Consequently I hold that the use to which the sand bund was put in this case was a non-natural user of land. I would dismiss the appeal, with costs to the respondent and certificate for two counsel.

Barakbah L.P.: I have had the advantage of reading the judgment of my brother Ong who has taken great pains to review and analyse the evidence in this case with his usual thoroughness and insight. I agree with his conclusions and there is nothing which I can usefully add except, briefly, as regards the cause of the collapse of 310 feet of bund A. A chain is as strong as its weakest link. If one link gives way, as the bund did, the fact that the other portions of the bund did not, only goes to prove that those portions were stronger. Therefore the tests carried out by Mr. Vail proved nothing. As a result there is no room for doubt in my mind that on the evidence, the appellants are entitled to succeed on the issue of negligence. Accordingly I agree that the respondent's cross-appeal should be allowed.

As regards *Rylands* v. *Fletcher* [1] I also agree with my brother Ong that the said bund was put to uses for which the appellants knew, or ought to have known, that it was unsuitable and hazardous to their neighbours. I also find as a fact that the bund was put to a non-natural use when it was made to hold water in great quantities instead of slimes. This finding of non-natural user of the appellants' lands, together with the finding on negligence makes it superfluous for me to enter into any further discussion on points of law, which would be purely an academic exercise.

The appeal is dismissed with costs.

Azmi C.J. (Malaya): I have had the advantage of reading the judgment of Ong F.J. with which I agree and have nothing to add.

Appeal dismissed. Cross-appeal allowed.

Solicitors: *Skrine & Co.; Murphy & Dunbar.*